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(54) **OPHTHALMIC DEVICES AND METHODS WITH APPLICATION SPECIFIC INTEGRATED CIRCUITS**

(75) Inventors: **Jean-Noel Fehr**, Bern (CH); **Walter Doll**, Bern (CH); **Urban Schnell**, Bern (CH)

(73) Assignee: **ELENZA, INC.**, Roanoke, CA (US)

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See application file for complete search history.

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Primary Examiner — David H Willse

Assistant Examiner — Tiffany Shipmon

(74) *Attorney, Agent, or Firm* — Foley & Lardner LLP

(57) **ABSTRACT**

Ophthalmic devices with dynamic electro-active elements offer variable optical power and/or depth of field that restore lost accommodation in individuals suffering from presbyopia or aphakia. An illustrative device senses physiological processes indicative of the accommodative response and actuates a dynamic electro-active element to provide the desired change in optical power and/or depth of field. The illustrative device includes two application-specific integrated circuits (ASICs) for processing the accommodative response and actuating the electro-active element: a high-voltage ASIC that steps up a low voltage from a power supply to a higher voltage suitable for actuating the electro-active element, and another ASIC that operates at low voltage (and therefore consumes little power) and controls the operating state of the high-voltage ASIC. Because each ASIC operates at the lowest possible voltage, the illustrative ophthalmic device dissipates less power than other ophthalmic devices.

19 Claims, 16 Drawing Sheets

